

B. Amendment to the Claims

Please amend claims 1, 16, 17, 23, 28 and 29 as follows.

1. (Currently Amended) A method of decomposing a substance ~~substances to be decomposed~~ in which a decomposition target substance and a decomposition promoting substance, which is capable of decomposing ~~having a function to decompose~~ said decomposition target substance under irradiation with light, are introduced into a decomposition area for decomposing the decomposition target substance, and those substances are contacted with each other while they are in a gas phase under irradiation with light to decompose the decomposition target substance, the method comprising the steps of:

- (a) introducing said decomposition promoting substance into said decomposition area;
- (b) irradiating said decomposition area with light; and
- (c) introducing the decomposition target substance into said decomposition area,

wherein the steps are started in the order of said steps (a), (b) and (c), the step (a) the earliest, at the time of starting the operation of decomposing said decomposition target substance,

and said steps are stopped in the order of (c), (b) and (a), the step (c) the earliest, at the time of ending the operation of decomposing said decomposition target substance.

2. (Withdrawn) The method according to claim 1, wherein said decomposition promoting substance is chlorine.
3. (Withdrawn) The method according to claim 2, wherein introduction of said chlorine into said decomposition area is carried out by supplying functional water having a function to generate chlorine in the decomposition area to contact the functional water with a gas comprised of the decomposition area.
4. (Withdrawn) The method according to claim 2, wherein introduction of said chlorine into said decomposition area is carried out by introducing a gas containing chlorine, prepared by contacting a gas supplied to an area storing therein functional water having a function to generate chlorine with the functional water existing in the functional water storage area, into said decomposition area.
5. (Withdrawn) The method according to claim 4, wherein introduction of said decomposition target substance and said chlorine into said decomposition area is carried out by introducing into said decomposition area a gas containing the decomposition target substance and chlorine prepared by contacting a gas containing the decomposition target substance supplied to said functional water storage area with said functional water existing in the functional water storage area.

6. (Withdrawn) The method according to claim 5, wherein introduction of said decomposition target substance and said chlorine into said decomposition area is stopped by substituting a gas not containing the decomposition target substance for the gas containing the decomposition target substance to be supplied to said functional water storage area.

7. (Withdrawn) The method according to claim 4, wherein the functional water contains hypochlorous ion.

8. (Withdrawn) The method according to claim 4, wherein the functional water is acidic water produced in the vicinity of the positive electrode by electrolysis of water containing an electrolyte.

9. (Withdrawn) The method according to claim 8, wherein the electrolyte is at least one of sodium chloride and potassium chloride.

10. (Withdrawn) The method according to claim 4, wherein the functional water is a mixture of acidic water produced in the vicinity of the positive electrode and alkaline water produced in the vicinity of the negative electrode by electrolysis of water containing an electrolyte.

11. (Withdrawn) The method according to claim 10, wherein the mixture is obtained by mixing the acidic water with the alkaline water at an acidic water to alkaline water ratio of 1 : 1 or lower by volume.

12. (Withdrawn) The method according to claim 4, wherein the functional water is a hypochlorite solution.

13. (Withdrawn) The method according to claim 12, wherein the hypochlorite is at least one selected from the group consisting of sodium hypochlorite and potassium hypochlorite.

14. (Withdrawn) The method according to claim 12, wherein the functional water further contains an inorganic acid or an organic acid.

15. (Withdrawn) The method according to claim 14, wherein the inorganic acid or organic acid is at least one compound selected from the group consisting of hydrochloric acid, fluoric acid, sulfuric acid, phosphoric acid, boric acid, acetic acid, formic acid, malic acid, citric acid and oxalic acid.

16. (Currently Amended) The method according to claim 4, wherein for the functional water, ~~a the hydrogen-ion concentration (pH value) is in the range of from 1 to 4, the oxidation-reduction potential (working electrode: platinum electrode, reference~~

~~electrode: silver-silver chloride electrode~~) is in the range of from 800 to 1500 mV, and the concentration of chlorine is in the range of from 5 to 150 mg/L.

17. (Currently Amended) The method according to claim 4, wherein for the functional water, ~~a the hydrogen-ion concentration (pH value)~~ is in the range of from 4 to 10, the oxidation-reduction potential (~~working electrode: platinum electrode, reference electrode: silver-silver chloride electrode~~) is in the range of from 300 to 1100 mV, and the concentration of chlorine is in the range of from 2 to 100 mg/L.

18. (Withdrawn) The method according to claim 4, wherein introduction of said decomposition target substance into said decomposition area is stopped by substituting a gas not containing the decomposition target substance for the gas to be supplied to said functional water storage area.

19. (Withdrawn) The method according to claim 1, wherein the light includes light with wavelengths in the range of from 300 to 500 nm.

20. (Withdrawn) The method according to claim 19, wherein the light includes light with wavelengths in the range of from 350 to 450 nm.

21. (Withdrawn) The method according to claim 1, wherein the amount of the light with which the irradiation is carried out is in the range of from 10  $\mu\text{W}/\text{cm}^2$  to 10  $\text{mW}/\text{cm}^2$ .

22. (Withdrawn) The method according to claim 21, wherein the amount of the light with which the irradiation is carried out is in the range of from 50  $\mu\text{W}/\text{cm}^2$  to 5  $\text{mW}/\text{cm}^2$ .

23. (Currently Amended) The method according to claim 1, wherein said decomposition ~~target~~ targent substance is a halogenated aliphatic hydrocarbon compound.

24. (Withdrawn) The method according to claim 23, wherein said halogenated aliphatic hydrocarbon compound is an aliphatic hydrocarbon compound comprised of an atom substituted with chlorine atom.

25. (Withdrawn) The method according to claim 24, wherein the halogenated aliphatic hydrocarbon compound is at least one selected from the group consisting of trichloroethylene, 1,1,1-trichloroethane, chloroethylene, tetrachloroethylene, 1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, trichloromethane (chloroform) and dichloromethane.

26. (Withdrawn) An apparatus for decomposing substances to be decomposed in which a decomposition target substance and a decomposition promoting substance having a function to decompose said decomposition target substance under irradiation with light are introduced into a decomposition area for decomposing the decomposition target substance, and those substances are contacted with each other under irradiation with light to decompose the decomposition target substance, comprising:

- a decomposition unit comprised of the decomposition area;
- a decomposition promoting substance introduction unit (d) for introducing said decomposition promoting substance into said decomposition area;
- a light-irradiation unit (e) for irradiating said decomposition area with light;
- a decomposition target substance introduction unit (f) for introducing said decomposition target substance into said decomposition area; and
- a drive unit for driving said decomposition promoting substance introduction unit (d), said light-irradiation unit (e) and said decomposition target substance introduction unit (f) individually,

wherein said drive unit starts driving said decomposition promoting substance introduction unit (d), said light-irradiation unit (e) and said decomposition target substance introduction unit (f) in the described order at the time of starting the operation of decomposing said decomposition target substance,

and stops said operated decomposition target substance introduction unit (f), said operated light-irradiation unit and (e) said operated decomposition promoting

substance introduction unit (d) in the described order at the time of ending the operation of decomposing said decomposition target substance.

27. (Withdrawn) The apparatus according to claim 26, wherein said drive unit carries out said starting and said stopping in accordance with a program preset in a computer.

28. (Currently Amended) A method of decomposing a substance ~~substances to be decomposed~~ in which a decomposition target substance and a decomposition promoting substance, which is capable of decomposing ~~having a function to decompose~~ said decomposition target substance under irradiation with light, are introduced into a decomposition area for decomposing the decomposition target substance, and those substances are contacted with each other while they are in a gas phase under irradiation with light to decompose the decomposition target substance, the method comprising the steps of:

- (a) introducing said decomposition promoting substance into said decomposition area;
- (b) irradiating said decomposition area with light; and
- (c) introducing the decomposition target substance into said decomposition area,



wherein the steps are started in the order of said steps (a), (b) and (c), the step (a) the earliest, at the time of starting the operation of decomposing said decomposition target substance.

29. (Currently Amended) A method of decomposing a substance ~~substances to be decomposed~~ in which a decomposition target substance and a decomposition promoting substance, which is capable of decomposing ~~having a function to decompose~~ said decomposition target substance under irradiation with light, are introduced into a decomposition area for decomposing the decomposition target substance, and those substances are contacted with each other while they are in a gas phase under irradiation with light to decompose the decomposition target substance, the method comprising the steps of:

- (a) introducing said decomposition promoting substance into said decomposition area;
- (b) irradiating said decomposition area with light; and
- (c) introducing the decomposition target substance into said decomposition area,

wherein the steps are stopped in the order of said steps (c), (b) and (a), the step (c) the earliest, at the time of stopping the operation of decomposing said decomposition target substance.

30. (Withdrawn) An apparatus for decomposing substances to be decomposed in which a decomposition target substance and a decomposition promoting substance having a function to decompose said decomposition target substance under irradiation with light are introduced into a decomposition area for decomposing the decomposition target substance, and those substances are contacted with each other under irradiation with light to decompose the decomposition target substance, comprising:

- a decomposition unit comprised of the decomposition area;
- a decomposition promoting substance introduction unit (d) for introducing the decomposition promoting substance into said decomposition area;
- a light-irradiation unit (e) for irradiating said decomposition area with light;
- a decomposition target substance introduction unit (f) for introducing said decomposition target substance into said decomposition area; and
- a drive unit for driving said decomposition promoting substance introduction unit (d), said light-irradiation unit (e) and said decomposition target substance introduction unit (f) individually,

wherein said drive unit starts driving said decomposition promoting substance introduction unit (d), said light-irradiation unit (e) and said decomposition target substance introduction unit (f) in the described order at the time of starting the operation of decomposing said decomposition target substance.

31. (Withdrawn) An apparatus for decomposing substances to be decomposed in which a decomposition target substance and a decomposition promoting substance having a function to decompose said decomposition target substance under irradiation with light are introduced into a decomposition area for decomposing the decomposition target substance, and those substances are contacted with each other under irradiation with light to decompose the decomposition target substance, comprising:

- a decomposition unit comprised of the decomposition area;
- a decomposition promoting substance introduction unit (d) for introducing the decomposition promoting substance into said decomposition area;
- a light-irradiation unit (e) for irradiating said decomposition area with light;
- a decomposition target substance introduction unit (f) for introducing said decomposition target substance into said decomposition area; and
- a drive unit for driving said decomposition promoting substance introduction unit (d), said light-irradiation unit (e) and said decomposition target substance introduction unit (f) individually,

wherein said drive unit stops said operated decomposition target substance introduction unit (f), said operated light-irradiation unit and (e) said operated decomposition promoting substance introduction unit (d) in the described order at the time of ending the operation of decomposing said decomposition target substance.